REMARKS

Claims 22-27 and 36-42 have been canceled without prejudice, to the filing of a divisional application.

Claims 1-21 and 28-35 are pending in the application.

The Office required a restriction to one of the following inventions:

I. Claims 1-21 and 22-27, drawn to an apparatus for testing electromagnetic connectivity in a transmission path in a drill string - class 324, subclass 642.

II. Claims 1-21 and 28-35 drawn to an apparatus for testing drill string – class 324, subclass 637.

III. Claims 1-21 and 36-42, drawn to an apparatus for testing electromagnetic connectivity, class 367, subclass 82.

Applicants have elected invention II, claims 1-21 and 28-35 without traverse. Accordingly claims 22-27 and 36-42 have been canceled without prejudice, to the filing of a divisional application.

The specification has been amended now to correct the contract number in the Federal Research Statement. Further amendments were made to paragraphs 5, 7, 33, 68, 76, 85, and 95-97 to correct other minor informalities.

The Office objected to claims 4, 5, 20, 30, 33, and 35 for various informalities. Claims 4, 5, 20, 30, 33, and 35 have been amended now to correct these informalities.

The Office rejected claims 1, 3-5, 11, 14, 28, 29, and 32 under 35 U.S.C. 102(b) as being anticipated by Tanigushi et al. (5,568,448).

Applicants respectfully traverse this rejection. Tanigushi et al. '448 is drawn to data transmission using acoustic waves. Quoting the abstract of '448: "A magnetostrictive element generates an ultrasonic wave and the generated ultrasonic wave is propagated through a propagation medium. An acoustic wave receiver receives the propagated ultrasonic wave at the other end of the propagation medium and converts it into an electric signal. A signal transmission is carried out in this way."

The present invention is drawn to methods and apparatus for testing electromagnetic connectivity in a drill string. The drill strings transmit data electromagnetically (rather than acoustically, as in '448) using a system of wiring and coils formed into the drill string. The drill string has numerous segments that are repeatedly assembled and disassembled, and these are subjected to extreme mechanical and thermal extremes in operation. As a result, it is desirable to test the electromagnetic connectivity in the drill strings in operation and as they are assembled and/or disassembled.

In order to clearly and distinctly point out the important structural and functional differences between Tanigushi et al. '448 and the present invention, independent claims 1, 14 and 28 have been amended now to state that it is an electromagnetic test signal that is sent down the transmission path in the drill string. Applicants believe that claims 1, 14 and 28 as amended are now allowable, and therefore respectfully request allowance of these claims.

Dependent claims 3-5, 11, 29 and 32 are also clearly drawn to elements and/or devices that are electromagnetic in nature, and since they also depend from allowable base claims, Applicants believe they are also allowable.

Accordingly, applicants respectfully request allowance of claims 1, 3-5, 11, 14, 28, 29, and 32.

The Office rejected claims 2, 15, and 16 under 35 U.S.C. 103(a) over Tanigushi. Applicants respectfully traverse this rejection for similar reasons as above; i.e. Tanigushi et al. '448 is drawn to data transmission using acoustic waves and the present invention is drawn to testing electromagnetic connectivity in a drill string. Applicants believe that Tanigushi et al. '448 is non-analogous art, and that one skilled in the art would not associate the acoustic system of Tanigushi et al. '448 with the electromagnetic test signal of the present invention. For this reason, Applicants believe that Tanigushi et al. '448 as a sole reference does not rise to the requirements for obviousness as a reference under 35 U.S.C. 103(a). Furthermore, since claims 2, 15, and 16 now depend from allowable base claims, Applicants believe regardless of whether Tanigushi et al. '448 is applicable as a reference, these claims are allowable.

Accordingly, Applicants respectfully request allowance of claims 2, 15, and 16.

The Office rejected claims 6-10, 12-13, 19-21, 30, 31, 33, and 35 under 35 U.S.C. 103(a) over Tanigushi in view of Pecault et al. (US PUB 2005/0046591). Applicants respectfully traverse this rejection. As stated above, Tanigushi et al. '448 is drawn to data transmission using acoustic waves and the present invention is drawn to testing electromagnetic connectivity in a drill string. For this and the reasons expressed above, applicants believe that one skilled in the art would not be motivated to combine Tanigushi et al. '448 with Pecault et al. (US PUB 2005/0046591).

Furthermore, since claims 6-10, 12-13, 19-21, 30, 31, 33, and 35 now depend from allowable base claims, applicants believe these claims are allowable regardless of whether one skilled in the art would be motivated to combine Tanigushi et al. '448 with Pecault et al.

Accordingly, Applicants respectfully request allowance of claims 6-10, 12-13, 19-21, 30, 31, 33, and 35.

The Office rejected claims 17 and 34 under 35 U.S.C. 103(a) over Tanigushi in view of Meador et al. (US 4,785,448). Applicants respectfully traverse this rejection with the same arguments stated immediately above, i.e. one skilled in the art would not be motivated to combine the acoustic system of Tanigushi et al. '448 with the electromagnetic system of Meador et al. (US 4,785,448).

Furthermore, since claims 17 and 34 now depend from allowable base claims, Applicants believe these claims are allowable regardless of whether one skilled in the art would be motivated to combine Tanigushi et al. '448 with Meador et al.

Accordingly, Applicants respectfully request allowance of claims 17 and 34.

The Office rejected claim 18 under 35 U.S.C. 103(a) over Tanigushi et al. and Meador et al. (US 4,785,448) in view of Spikerman (US 4,314,479). Applicants respectfully traverse this rejection with the same arguments stated immediately above, i.e. one skilled in the art would not be motivated to combine the acoustic system of Tanigushi et al. '448 with the electromagnetic system of Meador et al. in view of Spikerman.

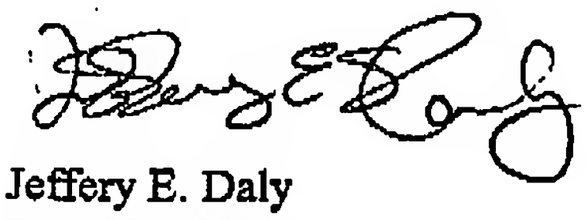
Furthermore, since claim 18 now depends from allowable base claim 14, Applicants believe this claim is allowable regardless of whether of whether one skilled in the art would be motivated to combine Tanigushi et al. '448 with Meador et al. in view of Spikerman.

Accordingly, Applicants respectfully request allowance of claim 18.

In view of the amendments and arguments made herein, Applicants respectfully submit that the application is now in condition for allowance. Accordingly, Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Please charge Deposit Account No. 180584 in the amount of $450, the fee required under 37 CFR 1.17(a)(2) for a two month extension for time. It is believed that there are no other fees due at this time. However, the Commissioner is hereby authorized to charge any fees which may be required at any time during the prosecution of this application without specific authorization, or credit any overpayment, to Deposit Account 180584. If there are any questions concerning the above, please contact the undersigned at (281) 878-5658.

Respectfully submitted,



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